

*REINFORCING EFFICACY OF FOOD ON
PERFORMANCE DURING PRE- AND POSTMEAL SESSIONS*

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Assessments were conducted to identify preferred foods for 9 adults with severe to profound mental retardation. Subsequently, the reinforcing effects of each participant's most highly preferred food were evaluated during sessions conducted before and after lunch. Results showed that 4 participants' response rates were higher during premeal sessions than during postmeal sessions. By contrast, pre- and postmeal response rates were indistinguishable for the other 5 participants. These results indicate that the reinforcing efficacy of food may (but does not necessarily) diminish following meals and suggest that the influence of meal schedules should be examined on an individual basis when food is used as reinforcement during training sessions.

DESCRIPTORS: establishing operations, meal effects, satiation, stimulus preference

Edible items often are used as reinforcers in skill-acquisition training for persons with severe behavioral deficits or excesses (Adelinis, Piazza, & Goh, 2001). A potential limitation of this practice is that the establishing operation (EO; Michael, 1982, 1993) for behavior maintained by food reinforcement may diminish as a result of continued food consumption, leading to decrements in performance. For example, Vollmer and Iwata (1991) observed that 1 participant's response rates increased from baseline during food-reinforcement sessions but decreased when the sessions were conducted within 15 min following lunch and an additional 10-min period of free access to the food used as the reinforcer during the session. More recently,

Gottschalk, Libby, and Graff (2000) found that preference for a given food was higher when participants did not have access to it for 48 hr prior to a food-preference assessment than when they had free access to the food immediately before the assessment. Although results from both studies suggest that access to food may diminish its reinforcing effects, interpretation must be cautious because (a) Vollmer and Iwata demonstrated the effects of access to food with only 1 participant, and it was unclear whether results were a function of meal consumption, pre-session access to a specific food reinforcer, or both; and (b) Gottschalk et al. did not examine the effects of food as reinforcement for any performance.

Under most naturalistic conditions, food-reinforcement sessions probably would not occur immediately following free access to the reinforcer but might occur soon after meals. The purpose of this study was to de-

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termine whether naturally occurring meals would affect performance adversely during postmeal sessions in which highly preferred food was used as reinforcement.

METHOD

Participants and Setting

Nine adults (Michelle, 28 years old; Randy, 38 years old; Eric, 62 years old; Sue, 47 years old; Debbie, 54 years old; Tim, 52 years old; Rose, 42 years old; Jerry, 39 years old; and Mark, 34 years old) participated. All participants had been diagnosed with severe to profound mental retardation; 6 lived in a residential facility for persons with developmental disabilities, and 3 lived in group homes. Sessions were conducted in training rooms containing a table, chairs, and materials needed for conducting sessions (see below).

Procedure

During Phase 1, preference for five snack foods, selected based on informal observations prior to the study, was assessed using procedures described by Fisher *et al.* (1992). Sessions were conducted 1 to 2 hr after breakfast. During each trial, a participant was given a choice between two foods; across trials, each food was paired with every other food once. The food chosen most frequently (and on at least 75% of trials) was selected for use as a reinforcer. Prior to Phase 2, participants were taught to press a stationary microswitch that activated either a light or a tape-recorded message ("I want some snack"). During Phase 2, two 5-min sessions were conducted daily, one 30 min prior to lunch (premeal) and the other 30 min following lunch (postmeal), in a multielement design. Each occurrence of switch pressing was followed by delivery of a small piece of the participant's most highly preferred snack. Informal baseline (no reinforcement) probes were conducted with 6 participants, and for-

mal baseline data were collected for 3 participants during sessions conducted immediately prior to premeal sessions.

Response Measurement and Reliability

During Phase 1, an observer recorded which snack food was selected on each trial. During Phase 2, an observer recorded the occurrence of each response on a digital counter. Reliability was assessed during 89% and 83% of the sessions during Phases 1 and 2, respectively, and yielded agreement scores of 100% for both measures. Data also were recorded on participants' consumption of breakfast and lunch during the study and indicated that all participants consumed all meals throughout the experiment.

RESULTS AND DISCUSSION

Results obtained in Phase 2 are shown in Figure 1. Baseline data collected for Michelle, Jerry, and Mark showed consistently lower response rates than when reinforcement was available (pre- or postmeal). Although less compelling, results of the baseline probes (not graphed) for other participants indicated that they usually pressed the microswitch several times and then stopped.

Comparisons of responding during pre- and postmeal sessions revealed two distinct patterns. Michelle's, Randy's, Eric's, and Sue's response rates were consistently higher during premeal sessions, although differences were small in Sue's case. These data extend results of the Vollmer and Iwata (1991) study, in which access to a specific food decreased its reinforcing efficacy during postmeal sessions. Similar results were observed in the present study even though the food consumed during meals was different than that used as reinforcement (although it is possible that the single exposure to the food reinforcer during premeal sessions may have contributed partially to the effect). Thus, exposure to food *per se* under naturalistic con-

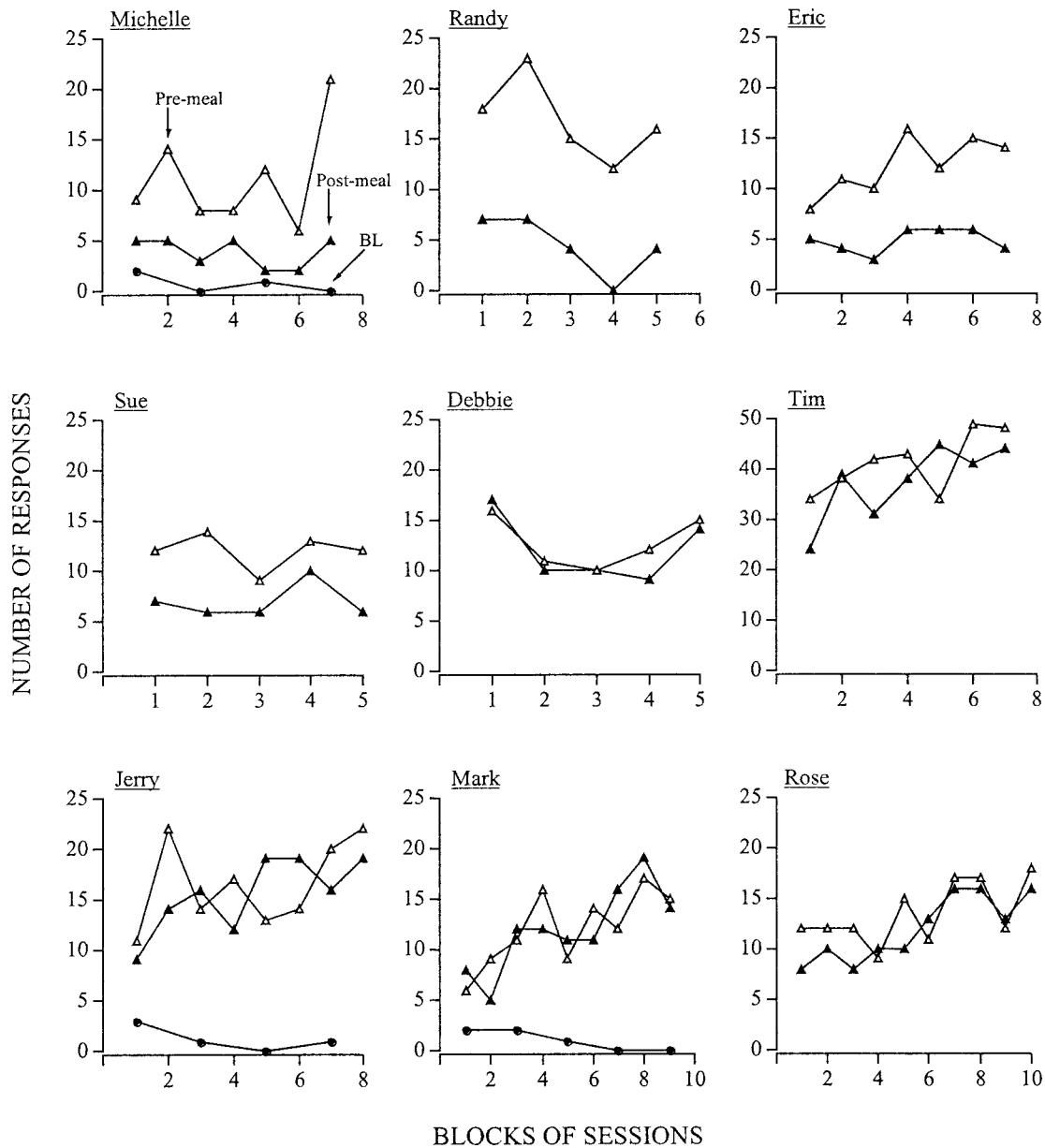


Figure 1. Number of responses exhibited when a high-preference food was used as a reinforcer during sessions conducted prior to and following lunch (all participants) and when no reinforcement was available (Michelle, Jerry, and Mark only).

ditions (regular meals) had deleterious effects on 4 participants' performance and suggests that, as a general rule, training sessions in which food is used as reinforcement should not be scheduled soon after meals.

By contrast, Debbie's, Tim's, Rose's, Jer-

ry's, and Mark's results showed that meal consumption had little or no influence on the reinforcing efficacy of food. Several factors could have been responsible for the absence of a postmeal satiation effect with these 5 participants. First, although partici-

pants consumed all of their meals during the study, it is possible that the amount of food they ate was insufficient to diminish its reinforcing effects. Second, the use of highly preferred food as reinforcement may have facilitated performance during postmeal sessions. Third, participants were not given free access to the reinforcer immediately prior to sessions (unlike in the Vollmer & Iwata, 1991, study). Thus, results obtained for Debbie, Tim, Rose, Jerry, and Mark suggest that the deleterious effects of meals on the potency of food reinforcement may be mitigated by a number of variables (e.g., meal portion, type of food served during the meal, type of food reinforcer used, pre-session exposure to the reinforcer) and indicate that further analyses are needed to identify the specific characteristics of meals and food reinforcement that affect postmeal performance.

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